

compositional formula  $\text{Li}_e\text{M}_3\text{fCo}_{1-\text{f}}\text{O}_2$  (where, M<sub>3</sub> is at least one element selected from the group consisting of Al, Mn, Mg and Ti,  $0 < e < 1.3$  and  $0 \leq f \leq 0.4$ ).

#### EXPERIMENT 5

5 In this experiment 5, the first oxide content of the positive electrode material was varied to compare performance characteristics of resulting batteries.

A blending ratio by weight of the first to second to third oxide was varied to 10:45:45, 20:40:40, 80:10:10 and 10 90:5:5. Otherwise, the procedure used in the above example to construct the battery D in accordance with the present invention was followed to construct batteries E1 - E4. These batteries were measured for 1C and 0.2C capacity retentions in the same manner as in the above Experiment 1.

15 The results are shown in Figure 5.

In Figure 5, the results obtained for the battery D (weight ratio of the first to second to third oxide = 50:25:25) used in the above Experiment 4 are also shown.

As can be seen from the results shown in Figure 5, when 20 the lithium-manganese complex oxide, i.e., the first oxide, is incorporated in the mixture in the amount of 20 - 80 % by weight, the 1C and 0.2C capacity retentions are improved and the deterioration of load characteristics with cycling can be suppressed. This is probably because the first oxide, 25 when added within the above-specified range, became more

effective to maintain stable contact between particles of the first oxide and the second oxide in the form of lithium-nickel-cobalt complex oxide during charge-discharge cycles.

#### EXPERIMENT 6

5 In this experiment 6, a ratio by content of the second to third oxide in the positive electrode material was varied to compare performance characteristics of resulting batteries.

10 A blending ratio by weight of the first to second to third oxide was varied to 50:3:47, 50:5:45, 50:45:5 and 50:47:3. Otherwise, the procedure used in the above example to construct the battery D in accordance with the present invention was followed to construct batteries F1 - F4. These batteries were measured for 1C and 0.2C capacity 15 retentions in the same manner as in the above Experiment 1. The results are shown in Figure 6.

In Figure 6, the results obtained for the battery D (weight ratio of the first to second to third oxide = 50:25:25) used in the above Experiment 4 are also shown.

20 As can be seen from the results shown in Figure 6, when the lithium-nickel-cobalt complex oxide, i.e., the second oxide, and the lithium-cobalt complex oxide, i.e., the third oxide, are mixed in the ratio by weight of 90:10 - 10:90, the 1C and 0.2C capacity retentions are improved and the 25 deterioration of load characteristics with cycling can be

suppressed. This is considered due to the addition of the third oxide having high electronic conductivity to the active material comprising the first and second oxides with improved electronic conductivities that caused a further  
5 change in electronic state of the active material in its entirety.

#### EXPERIMENT 7

In this experiment 7, a mean particle diameter of the third oxide in the positive electrode material was varied to  
10 compare performance characteristics of resulting batteries.

During synthesis of the third oxide, size reduction was effected in such a controlled fashion as to obtain positive electrode materials having mean particle diameters specified in Table 2. Otherwise, the procedure used in the example to  
15 construct the battery D in accordance with the present invention was followed to construct batteries G1 - G4.

[TABLE 4]

Battery	Particle Diameter of First Oxide	Particle Diameter of Second Oxide	Particle Diameter of Third Oxide
G1	15 $\mu\text{m}$	10 $\mu\text{m}$	2 $\mu\text{m}$
G2	15 $\mu\text{m}$	10 $\mu\text{m}$	3 $\mu\text{m}$
D	15 $\mu\text{m}$	10 $\mu\text{m}$	10 $\mu\text{m}$
G3	15 $\mu\text{m}$	10 $\mu\text{m}$	15 $\mu\text{m}$
G4	15 $\mu\text{m}$	10 $\mu\text{m}$	20 $\mu\text{m}$